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VOL. 65, NO. 8 PAGES 113-128

SCIENCE NEWS LETTER

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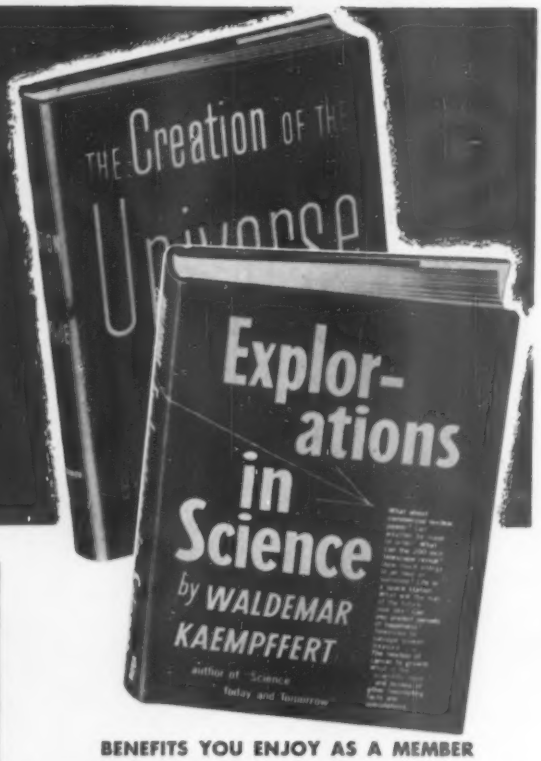

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PHYSICS

New Atomic Material

Hint at possibility of using uranium 238, considered nonfissionable, as source for nuclear energy. It releases three to five neutrons when bombarded with relatively heavy atoms.

▶ A NEW possibility has arisen of obtaining nuclear energy directly from supposedly nonfissionable uranium that composes 99.3% of the earth's supply of this element.

The same scientific announcement that revealed the manufacture of the latest and heaviest chemical element, No. 99, tells how relatively heavy atoms of nitrogen and carbon can be used to bombard uranium isotope 238, with the release of three to five neutrons.

This is the important new discovery that may, somehow, indicate the possibility of a new atomic energy reaction, possibly even a new kind of atomic bomb. The A-bomb reaction operates by fission that releases one and a half neutrons per fission. That is necessary and sufficient to keep the chain reaction going, explosively or more peacefully in an atomic reactor.

Heretofore no use for uranium 238 has been known except to convert it to plutonium. Plutonium 239 shares with uranium 235, the rare unstable isotope, ability to fission spontaneously whenever a neutron is encountered. These are the atomic fuels that are now practical.

Heavy particles like nitrogen and carbon, used in the cyclotron in place of hydrogen and helium as bombarding particles, give rise to many neutrons, it appears from the scientific papers reporting the process in *Physical Review* (Jan. 1).

At the same time, the new elements resulting from the nuclear reactions are six and seven steps up the scale of transuranium elements. When the bombarding particle is nitrogen, this produces the new man-made element 99. This latest element has not been produced by a small step from californium, element 98. (See SNL, Feb. 13, p. 103.)

An air of mystery hangs about the discovery of the new man-made chemical element 99. Coupled with the fact that a fundamental law of cyclotron operation discovered in this country remains unpublished, while the same law has appeared in two British scientific journals, *Proceedings of the Physical Society* and *Nature*, as the independent discovery of scientists at the University of Birmingham, the wisdom of secrecy in scientific matters must again be questioned.

In the article announcing element 99 a footnote states:

"There is unpublished information relevant to element 99 at the University of California, Argonne National Laboratory, and Los Alamos Scientific Laboratory. Until this information is published the question of the first preparation should not be prejudged on the basis of this paper."

Two departments of the University of California contribute complementary papers to the current *Physical Review*. The general law of cyclotron tuning, used for producing the new element 99 in one operation by adding nitrogen to uranium 238, in the 60-inch cyclotron of the Crocker Laboratory is announced by Drs. G. Bernard Rossi, William B. Jones, Jack M. Hollander and Joseph G. Hamilton of the Crocker Laboratory, the Radiation Laboratory and the Division of Medical Physics.

According to this law, much heavier ions than the hydrogen and helium ones originally used to bombard uranium can now be used in the cyclotron.

Carbon, which is 12 times as heavy as hydrogen, and nitrogen, which is 14 times as heavy, can be kept in motion by the cyclotron's magnetic field when it is tuned to a resonance that is one-third the natural vibration period of the heavier particles. Other heavy particles that have been tried out in the cyclotron include beryllium, oxygen and neon.

Announcement of this fundamental law for operating the cyclotron by principles analogous to the well-known harmonic vibrations in music is stated in the *Physical Review* article to have been reported previously. However, the reference cited by the authors of the paper is to an unclassified report issued in 1951 by the California Radiation Laboratory, but still unpublished. This is the law reported independently by a group operating a 60-inch cyclotron at the University of Birmingham in England.

Must American scientists turn to British sources to learn what has been accomplished but kept secret in their own country?

The second paper first announces the transmutation products of uranium 238, including two isotopes of element 99. This paper is by Albert Ghiorso, G. Bernard Rossi, Bernard G. Harvey and Stanley G. Thompson of the Radiation Laboratory and the Department of Chemistry, University of California.

It may be the emission of neutrons in quantity is keeping these researches secret. This would be like keeping secret the recipe for making match heads for the production of fire. It will not keep fires from being started. It will only give commercial advantage to those who do not see any value in always doing things the hard way.

Science News Letter, February 20, 1954

AERONAUTICS

Convertible Airplanes

▶ CONVERTIBLE AIRPLANES may prove to be useful military tools, but they are not expected to revolutionize the mode of everyday travel, the Aircraft Industries Association has said.

Helicopters already are doing well on short inter-city hauls. Regular airliners are performing satisfactorily on the long-distance runs. Convertiplanes seem unlikely to improve on either of these commercial services.

However, the hybrid planes, which are the aeronautical engineer's cross between a helicopter and its fixed-wing cousin, are expected to be highly useful in military reconnaissance.

They can take off vertically and fly at fast forward speeds toward the enemy.

FIRST MILITARY CONVERTIPLANE—Known as the XV-1, this odd-looking craft, cross between an airplane and a helicopter, is called a convertiplane. The rotor is for vertical flight, the propeller for forward flight.

They can hover while observations are made of enemy gun emplacements and tank movements, and while photographs are taken. They can dart away at a moment's notice when danger threatens.

Convertiplanes, such as the XV-1 just announced by the Air Force's Air Research and Development Command and the McDonnell Aircraft Corporation, are designed to bridge the gap between the conventional plane and the helicopter.

The helicopter can take off vertically, hover, squeeze in and out of tight quarters in rough areas and land in areas impossible for regular planes. Helicopters cannot carry a heavy payload economically. Their forward flight speed is low, their ceiling is limited and their controls are complex.

Fixed-wing planes have these advantages: high speed, high load-carrying capacity, high rate of climb, high operational ceiling, simple controls and fuel economy. Disadvantages are high-speed takeoffs and landings requiring long smooth runways, flat descent angle and poor slow-speed control.

The McDonnell design embodies a helicopter rotor on the XV-1's top, plus a pusher propeller behind its stubby wings. It is designed to carry three passengers, or two litter patients and a medical attendant, in addition to the pilot.

The XV-1 is the first military aircraft of its kind ever developed. Its helicopter rotor is powered by jets on the tips of the blades.

Although no flight tests have been made on the plane, performance tests on the ground are getting under way. The first XV-1 flight is scheduled for sometime this coming summer.

Other designs proposed in the past include such things as a regular type airplane propeller on the end of a helicopter rotor. The propeller swivels to pull the rotor around during takeoff. In the sky, the rotor is locked and the propeller on its end straightens out to pull the plane forward in fast flight.

Another design consists of two large helicopter rotors on the end of a fixed wing. The whole motor assemblies rotate 90 degrees to change the rotors from the "lifting" to "forward-flight" positions.

A third design was envisioned by an engineer who believed a plane could take off with its nose pointed straight into the sky, then pitch forward into normal flying position. Other engineers feared the craft's speed would be insufficient to permit the fixed wings to assume the plane's load when the time came.

Science News Letter, February 20, 1954

MEDICINE

Urge New TB Treatment

➤ A COMBINATION of a relatively new gout medicine, probenecid, and PAS, short for para-aminosalicylic acid, should be tried as treatment for tuberculosis, Drs. David T. Carr and Alfred G. Karlson of the Mayo Clinic, Rochester, Minn., advise.

They base their advice on the good results in tuberculous guinea pigs treated with the combination of these two recently developed drugs.

Probenecid, known also by its trade name of Benemid, has previously been suggested as a good team-mate for PAS already used in treatment of tuberculosis. Tests on a small number of patients showed it stepped up the concentration of PAS in the blood of the patients two to four times.

This finding was announced by Dr. William P. Boger of Sharp and Dohme, Benemid manufacturer, and Dr. Forrest W. Pitts of the Philadelphia General Hospital. (See SNL, June 23, 1951, and Aug. 12, 1950, p. 100).

Further studies by Drs. Carr and Karlson and E. V. Bridge at the Mayo Clinic showed that blood serum after PAS and probenecid had been given had greater ability to check tuberculosis germs in the test tube.

In spite of this, Drs. Carr and Karlson point out in their latest report, there have been no reports of studies on patients comparing the anti-TB effects of PAS alone and with probenecid. Since such studies would be difficult to make on patients, the Mayo Clinic doctors used guinea pigs to make their tests.

They injected 46 of these animals with tuberculosis germs. After 21 days, six were killed and found to have typical signs of TB. The other 40 were divided into four groups. One was left untreated for control. A second group got probenecid only. A third got PAS only. The fourth group got both drugs.

After 62 days the surviving animals were killed and examined, and the extent of the disease recorded on a chart for determining an index of infection. The untreated controls and the animals getting only probenecid had extensive tuberculosis. The ones getting PAS alone had active disease, but less than the first two groups. The ones getting PAS plus probenecid had, in contrast, "very little evidence of disease," the doctors state.

On the index of infection rating from one to 100, the untreated controls and probenecid-only groups rated about 65, the PAS-only group about 35, and the PAS plus probenecid group about 19.

In their report in *Proceedings of the Staff Meetings of the Mayo Clinic* (Jan. 13), Drs. Carr and Karlson state: "It is reasonable to predict that the concurrent administration of probenecid with PAS would enhance the therapeutic effect of PAS in tuberculosis or permit the use of a smaller dose of PAS without loss of efficacy. Unless PAS is completely replaced by other antituberculosis drugs a clinical study of this problem should be attempted."

Science News Letter, February 20, 1954

• RADIO

Saturday, Feb. 27, 1954, 3:15-3:30 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Merrill Moore, psychiatrist and poet of Boston, Mass., will discuss "The Science of the Sonnet."

The National Science Foundation has made 100 grants totaling about $1,045,000 for *scientific research*, conferences, education and information exchange this year.

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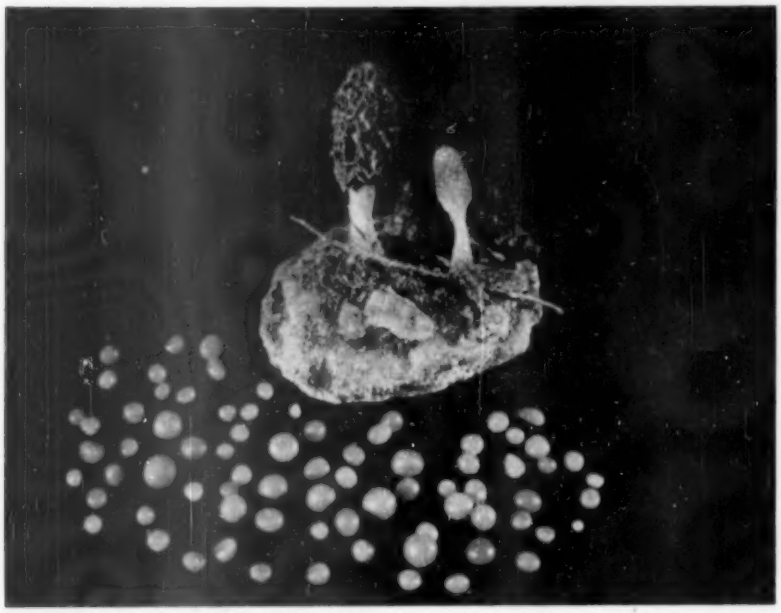

RARE MUSHROOM DUPLICATED—This photograph shows a model of a species of Morchella, rare European mushroom, placed behind the round, pea-sized version grown in the laboratory at Syracuse University by a method similar to that used for penicillin.

MYCOLOGY

Grow Mushroom in Lab

► LOVERS OF good steak dinners can now enjoy a super-delicious mushroom, grown artificially in laboratories in four days.

Drs. C. C. Carpenter, Paul Klens and Chester F. Koda, working at Syracuse University, Syracuse, N. Y., are responsible for the new boon to gourmets. The mushroom is *Morchella hortensis,* long prized by European connoisseurs.

Much smaller than the familiar commercially grown mushroom, *Agaricus campestris,* freeze drying turns the rare *Morchella* into a seasoning that can be used on steaks, in soups and other dishes as salt and pepper is used.

Ordinarily when the spores in a mushroom cap unite, they start growing by sending out minute fibers. Months, or years later, stems and caps develop from the fibers.

The Syracuse scientists developed a method of by-passing the spore stage and growing the caps directly in glass tanks. This is similar to the way such antibiotics as penicillin are grown.

A tiny bit of the microorganism was put into a test tube containing nutrients. When it had grown sufficiently, it was transferred to a bottle in a machine that shook the solution 110 times a minute for four days. At the end of that time, about 25 to 30 pellets had been produced, the largest approximately one-third of an inch across.

These pellets were chopped up and the fragments poured into glass tanks with the nutrient medium. In four days, each of the fragments grew into a pea-sized mushroom ball, increasing the original number of edible pellets 10,000 to 1.

Whenever more mushrooms are wanted, a few balls are chopped up and put into the glass tanks. Four days later, the process is complete.

The discovery that a seasoning powder could be made by freeze drying the mushrooms came accidentally. Because of its size and fragility, the scientists believe the fast-growing mushroom will be used largely as seasoning.

Science News Letter, February 20, 1954

TECHNOLOGY

Corn Popper Cleans Hypodermic Needles

► HOT OIL in electric popcorn poppers is good for cleaning hypodermic needles after injections. The method is "probably the most effective" for softening and loosening dried blood and medicines that often plug the needles and are hard to get out, the Hospital Bureau of Standards and Supplies, New York, reports.

Science News Letter, February 20, 1954

ARCHAEOLOGY

Find Artists' Tools of New Stone Age Culture

► ARTISTIC TOOLS used by a previously unknown people who lived in the Old Stone Age just after the days of Neanderthal Man were among the finds made in Shanidar Cave in northern Iraq by Dr. Ralph S. Solecki of the Smithsonian Institution.

First report of this new people was contained in a letter from Dr. Solecki to his colleagues at the Smithsonian. He has named the people the "Baradost Culture," after the mountain in which the cave is located. Evidence of the people was found in the same cave in which Dr. Solecki found the bones of a 75,000-year-old baby last summer. The Baradost people lived some time after the Old Stone Age child.

Very little is known of the Baradost people, but they left behind specimens of a stone industry. Among the stone implements are a high proportion of well-made flint burins, or gravers, which were probably used to carve artistic designs on stone or bone objects. There is also an abundance of notched flint flakes and blades that probably served as knives.

Evidence was found that they lived through at least two severe earthquakes, such as those that shook the islands of Greece last summer. Large blocks of stone were shaken from the cave's roof at that time.

Shanidar Cave was recently visited by Dr. Dorothy A. E. Garrod, eminent archaeologist formerly of Cambridge University, England. Dr. Garrod, who has herself made excavations nearby in Iraq, confirmed Dr. Solecki's estimate of the age of his finds.

She also regards the Baradost Culture as something previously completely unknown, but she says that it fills a gap between two other cultures previously known in Iraq, the Zarzi and the Hazer Merd cultures.

Science News Letter, February 20, 1954

ASTRONOMY

Periodic Comet's Return Spotted in Western Sky

► THE FIRST observation of periodic comet Honda, originally discovered in 1948, has been made by Dr. George Van Biesbroeck at McDonald Observatory, Mount Locke, Texas.

Report of its rediscovery was telegraphed to observatories throughout the country by Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the Western Hemisphere, so that other astronomers can search low in the western sky for it.

The comet was in the constellation of Aquarius, the water carrier, when it was rediscovered. Too faint to be seen without a telescope, the diffuse object is of tenth magnitude and was spotted at 8:59 p.m. on Feb. 3.

Science News Letter, February 20, 1954

GENERAL SCIENCE

Research of STS Winners

Independent scientific work of high excellence done by final competitors for Westinghouse Science Scholarships coming to Washington for the Science Talent Institute.

► HIGH SCHOOL scientists, who may be leaders in tomorrow's world of science, will meet in Washington on Feb. 25 for the five-day Thirteenth Annual Science Talent Institute.

They will bring with them exhibits they have made demonstrating projects in their particular field of research. The 40 young scientists who will participate in the Science Talent Institute will compete for $11,000 in Westinghouse Science Scholarships. The scholarships range in value from the grand prize of $2,800 to $100.

Analyses Speeded Up

► A NEW laboratory technique to speed up chemical analyses now done by the colorful chromatography method has been developed by Edward Patrick Scanlon, 17, of Minneapolis, Minn.

He uses a spinning glass plate that slings drops of unknown solutions out on filter paper. The filter paper is put on the center of the turntable and the chemical solution in turn is dropped on the paper.

As the whole assembly turns, centrifugal force speeds up the rate at which the solution distributes itself over the filter paper. When a "developer" is applied, colors appear that tell trained chemists what metals are in the solution.

The young DeLaSalle High School senior built his laboratory aid himself. He attached a glass plate to the shaft of an electric motor.

Planetarium for $12

► AN ATTIC-SIZED planetarium that projects stars, planets, the sun and a meridian line has been built in the home of 17-year-old Victor A. Schmidt in Baltimore, Md.

The Milford Mill High School senior constructed his planetarium at a cost of only $12. It is the outgrowth of two years' work that produced, all told, three different planetariums.

The current model was designed to eliminate most of the shortcomings of the first two models. Victor's finished instrument resembles in many ways the Spitz projectors used in a planetarium in Baltimore.

Victor's planetarium is situated in his attic bedroom. A black "skyline" is painted around the walls. Room lights can be dimmed out at the start of a demonstration.

His $12 projector is driven by a store display electric motor that turns the whole assembly once every three minutes. The projector can be adjusted to show star positions as viewed from the North Pole. In addition to projecting constellation outlines, stars, planets and the sun, Victor's outfit also can show eclipses and the polar aurora.

Disfigured Cacti Cause

► WEAK TRACES of radioactivity in the soil at Pinnacle Peak near Phoenix, Ariz., may be the cause of disfiguring blemishes on cacti growing there, 16-year-old Susan H. Lee of the North Phoenix High School has concluded.

Susan had samples of the soil analyzed at the U. S. Bureau of Mines to determine their content and radioactivity. Radiometric tests showed all samples had slight traces of uranium.

Soil obtained from around the plant's base about six inches below the surface displayed enough radioactivity to be detected by a Geiger counter.

The disfigured plants are called "crested cacti." The crests cause the cactus to fan out in abnormal growth. One scientist who previously studied this condition put forth his belief that the crestations were caused by arsenic or strychnine poisons in the earth.

Susan ran experiments on 30 cacti, feeding some with dilute solutions of strychnine sulfate and arsenious oxide. Half of her samples died. The half that lived did not develop crests.

On field trips to the Pinnacle Peak area, the high school senior also discovered that crested cacti seem to grow in clumps. Disfigured cacti seemed to be clustered in areas having a "radius of disfigurement" of 300 feet. Cactus plants growing outside that area were normal.

Run Allergy Studies

► TWO OF the eight girls who won national honors owe their success in part to their allergies.

Mary Jeanne Kreek, 17, a senior at the Woodrow Wilson High School in Washington, D. C., was told five years ago that she was allergic to 36 things. Deciding to live "adequately instead of neurotically," she delved into the science of allergies to discover what she could learn about them.

The other girl is 18-year-old Carol Jean Gansz, senior at the Evanston Township High School in Evanston, Ill. Carol has done a lot of nose-blowing because of pollens and spores of fungi. She also decided to find out what she could about it.

Mary Jeanne made extracts of house dust from her vacuum cleaner, duck feathers from her pillow, and hair from her head. She compared her allergic reaction to her home-made extracts with her reaction to the extracts normally used in allergy tests. She discovered that her reaction to her own extracts was sometimes stronger, and sometimes weaker, than her reaction to the "normal" extracts.

She suggests that more accurate diagnoses might be obtained if the sufferer is tested with extracts made from his home irritants rather than with the samples ordinarily used.

Meanwhile, Carol was trying to learn whether the smoky atmosphere from autumn bonfires had anything to do with her allergies. She ran experiments using small leaf fires. She set up stations around the fires to catch pollen and spores of fungi on microscope slides. After analyzing her slides, she concluded that smoky air does carry more allergens than the general atmosphere.

Mary Jeanne plans to study medicine in college and hopes to become a physician. Carol intends to study liberal arts and sciences. She expects to become a biological research worker or a science teacher.

Ancient Bronze Restored

► AN UNUSUAL method of restoring ancient bronze relics has been worked out by Robert J. Rodden, 17-year-old senior at the New Brunswick High School, New Brunswick, N. J. This teen-aged scientist has shown that bronze relics often can be restored with a treatment of Versene, a short name for ethylene diamine tetra-acetic acid.

Bronze pieces covered with a ⅛-inch-thick crust of corrosion required about two weeks to clean in a 3.4% solution of the acid, he found. If the corrosion was ¼-inch thick, cleaning time increased to three weeks.

The acid ate away the corrosion products and minerals, and loosened earth particles in the crust around the bronze. It left a thin layer of copper oxide beneath, through which some of the original designs on the bronze relics could be seen.

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PHYSICS

Microscope "Sees" Atomic Particles

► A MICROSCOPE that spots clusters of radioactive atoms in metal or living tissue has been created at the University of Michigan by William Kerr, assistant professor of electrical engineering. The microscope speeds up a slow process now involving photographic plates.

A sample of the material to be examined is placed under the microscope and searched for radioactive atoms that emit beta rays. When the location of the greatest activity is found, the researcher then shifts to an ordinary microscope lens system to examine the sample visually.

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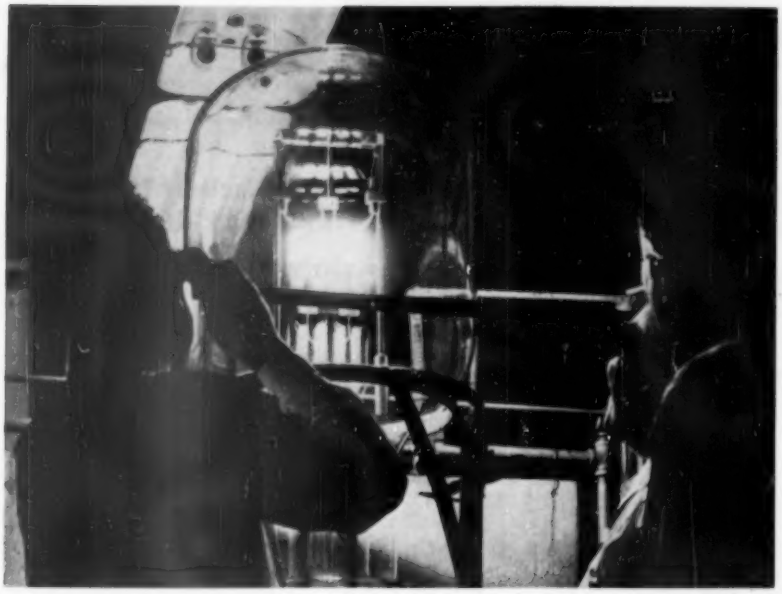


LARGEST LIGHT BULB—Original test lighting of the giant light bulb, designed and assembled by General Electric engineers in honor of Edison's 107th birthday, is shown here. Scientists were required to use heavy glasses when studying its performance at close range.

TECHNOLOGY

Giant Light Bulb Created To Honor Thomas Edison

▶ THE WORLD'S largest light bulb, assembled at Nela Park, Cleveland, was switched on Feb. 12 at Rockefeller Center, New York, to mark Edison's 107th birthday.

One and a half times larger than the present record-sized incandescent lamp, the 75,000-watt General Electric creation produces as much light as would 2,874 60-watt household bulbs burning at once. It uses enough electricity to light 83 average American houses.

Its 12.5-foot-long filament weighs 2.7 pounds, is 3/16 of an inch in diameter and holds enough tungsten to make the coiled filaments of 67,500 60-watt light bulbs. Despite its giant size, the bulb is said to be one of the most efficient incandescent light sources yet produced.

Science News Letter, February 20, 1954

PUBLIC HEALTH

Rabies Control Program

Congressional action is expected on a national program to control outbreaks of rabies, a situation termed a "national disgrace" by health and veterinary authorities.

▶ HOPE FOR a national program to control rabies is considerably strengthened by Congressional action.

While Chicago, the nation's second largest city, is currently harassed by a rabies outbreak, Pennsylvania, New York, Virginia and other regions have experienced the same difficulty in recent years.

Health and veterinary authorities have called the situation a "national disgrace" and have long held that this killer of man, dogs and other animals can best be controlled or wiped out by a nation-wide attack.

Rep. Timothy Patrick Sheehan (R-Ill.) has now asked the Public Health Service to think in terms of drawing up a National Rabies Control Program. Dr. James Steele, chief veterinarian of the Public Health Service, told SCIENCE SERVICE that he sees such a program as covering the following points:

1. Inauguration of new research and expansion of some already under way, particularly with regard to rabies in wild animals.

2. Continuation of immunization studies, especially to learn how young a dog can be protected by anti-rabies vaccination and how long such protection will last.

3. Assistance to the states through consultation, with educational material and by regional demonstrations showing how to clean up a large area threatened by rabies.

4. Investigation of methods of treating humans after they have been bitten by a rabid dog, including treatment of the wound.

5. Training local, state and federal personnel in diagnosis, control procedures and immunization of man and animals.

The Public Health Service has sent some of its experts to Chicago to help local authorities straighten out the vaccination situation and to give assurance of the safety of it for dogs.

During 1953, there were 8,453 cases of rabies in animals and humans reported to the Department of Agriculture's Bureau of Animal Industry. Also during 1953, 13 cases in humans were reported to the Public Health Service.

While reports do not show a large increase in recent years, the disease continues to flare up in new areas as it burns itself out in others. Chicago, for example, had not had any rabies trouble in the 18 years prior to the present outbreak.

An actual increase of the disease in wild life has occurred, however. This complicates the problem greatly, Dr. Steele pointed out. It is tied to our conservation and farm program, the retiring of marginal farm land and the great decrease in demand for fur from foxes, skunks, raccoons and similar animals. In Minnesota alone, the annual market for such animals for fur has dropped from some 400,000 animals to about 20,000.

Bats are now known to be infected with the rabies virus which has "spilled over" to them from the other wild life, Dr. Steele said.

Birds may also have become infected with rabies, some authorities suggest.

In some southern communities, children going to school carry clubs to fend off foxes or other wild animals which, instead of running from humans as formerly, now run to and attack them.

Efforts to control rabies by eradicating the wild animals that now make up a reservoir of the disease need ecological studies, Dr. Steele said, to find the weak link in the chain.

Rabies, once it develops in an animal or human, always kills. But Pasteur treatment, taken immediately after the virus has gotten into the body from a bite, will prevent the disease. There is hope of an easier, quicker and equally effective treatment, but research on this is still in the experimental stage.

Dogs can be protected from rabies by vaccination. A new vaccine for dogs is reported to give protection for two years, and there is hope that it will protect for the dog's lifetime. This, however, has not yet been proved.

In some areas where rabies is extensive among the wild animals, farmers are giving vaccinations to their stock as well as to their pet dogs.

Science News Letter, February 20, 1954

PSYCHIATRY

Double Slot Machine Helps Mental Patients

► A KIND of psychological double slot machine can be used to measure the improvement of mentally ill patients and also to stimulate this improvement, Drs. H. N. Peters and O. D. Murphree of the Veterans Administration Hospital, North Little Rock, Ark., indicate in *Science* (Feb. 5).

When a patient sits in front of one of these machines, he is faced by a bank of ten levers. If he pulls the correct one, he receives a bar of candy from the machine. A simple trick of wiring will rig two of the machines so that the correct lever must be pulled on both machines simultaneously in order to get the candy from the machine.

Since a characteristic of schizophrenia is an inability to work or cooperate with other persons, the doctors developed this double slot machine to study and treat their patients.

Even extremely regressed schizophrenics, they found, can learn to cooperate on the double slot machine. Sometimes they do this by watching the partner to follow his lead on which lever to pull. Sometimes they tell him which one is correct. Sometimes they will hold back pulling a lever until they see the partner pull the same one. And sometimes they explain to the partner the principle of the solution.

Science News Letter, February 20, 1954

AGRICULTURE

Modern Methods Could Double Coffee Production

► COFFEE PRODUCTION could be practically doubled in many Latin American areas with modern, scientific agricultural methods, experts in the United States are agreed.

No one will predict, however, that greater production would mean a return to cheap coffee.

Alphonso Varela, technical adviser to the Coffee Commission in Washington, reports that most Latin countries have launched agricultural research on improving coffee trees and production.

As for hopes that increased production would mean cheap coffee, Mr. Varela indicated this is most unlikely. The industrial development of the coffee countries has meant the end of the cheap labor which was the basis of cheap coffee.

In Costa Rica, the Organization of American States maintains the Inter-American Institute of Agricultural Science where coffee research is carried on. The United States participates in this program.

Most of this research, however, is in its first stages. Dr. C. A. Krug, coffee geneticist in Brazil, has developed a new tree with high yields, Mr. Varela said, but the beans of the new tree are deformed. Dr. Krug is now trying to develop good beans on his highly productive tree.

Elsewhere in Latin America, work on fertilization, terracing, drainage, insect and disease control is just beginning to show results.

Through the U. S. Department of Agriculture, a project on coffee cultivation was started at the University of Puerto Rico. Since 1950, methods have been found to double the yield of coffee trees on that island.

The shortage of trained specialists, engineers and research scientists in the agricultural fields seriously hobbles Latin American countries in their efforts to build up agriculture. Mr. Varela and officials in the Agriculture Department report keen interest in Latin America in the development of scientific agriculture.

Nathan Koenig of the Department characterized agriculture in that area as similar to this nation's before the development of new methods, crops and machinery.

Science News Letter, February 20, 1954

ENDOCRINOLOGY

Frozen Male Sex Glands Grafted Successfully

► SUCCESS IN grafting frozen male sex glands in rats is announced by Drs. A. S. Parkes and A. U. Smith of the National Institute for Medical Research, London, in the *British Medical Journal* (Feb. 6).

A hint, but no more than that, that the special freezing technique may make possible transplants of human gland tissue in a state capable of continuing to live appears in the report.

Success with the rat gland grafts resulted from the method in which the glands were frozen in material containing glycerol. The scientists had previously discovered that this protects the spermatozoa from the otherwise fatal effects of freezing and thawing.

The same method was used successfully for grafts of rat ovarian tissue.

In the experiments with the male sex glands, seven out of nine animals had grafts showing androgenic (masculine) activity when the glands had been stored in a frozen state for as long as 22 weeks before being grafted.

Science News Letter, February 20, 1954

METEOROLOGY

3-D Being Used By Weathermen

► EVEN THE weathermen are now using 3-D. Albert Carlin of the U. S. Weather Bureau in Washington is drawing three-dimensional charts to give other weathermen a better picture of how the air masses that bring our weather move across the country.

The charts, still in the experimental stage, will eventually be used not only in teaching meteorology, Mr. Carlin foresees, but also in other classes such as geology and mapping, where showing contours in three dimensions would be helpful.

Science News Letter, February 20, 1954

IN SCIEN

MEDICINE

Polio Vaccine Trials Evaluation Planned

► THE VALUE of the polio vaccine to be given a mass trial starting late in March or early April will be determined in an independent study directed by Dr. Thomas Francis Jr., chairman of the department of epidemiology in the University of Michigan School of Public Health.

The evaluation study will be financed by a grant from the National Foundation for Infantile Paralysis, New York, which is sponsoring the trials of the vaccine, but Dr. Francis made it clear that the evaluation study will be conducted on a completely independent basis.

An evaluation center will be established at the University of Michigan and the university's survey research center will assist in collecting data and preparing statistical analyses.

Although the trial vaccine will be triple-checked for safety before use, Dr. Francis pointed out that the vaccine's effect in controlling polio is not yet proved.

"It is not known at present," he said, "whether the vaccine to be used will be highly effective, moderately effective or ineffective in protection of human subjects against paralytic poliomyelitis.

"In an independent study of the results of the test, we will attempt to insure an adequate measurement of the vaccine's influence through the collection and analysis of good and unbiased data," Dr. Francis stated.

Science News Letter, February 20, 1954

METEOROLOGY

Electronic "Brain" Predicts Storm's Path

► A GIANT electronic "brain" could have accurately predicted the pre-winter snowstorms that battered the Atlantic coast on Nov. 6-8, 1953.

Because of its success in doing so after the fact but using only information available before its development, more warning of the approach and path of such massive storm centers will be possible in the future. (See SNL, Nov. 14, 1953, p. 309.)

Most human forecasters predicted that the intense storm, which dumped up to a foot of snow on parts of Pennsylvania and New York, would move out to sea, but it struck northward instead. The electronic computer, however, using mathematical methods, "predicted the motion more correctly and also the intensification of the storm," a special study by the U. S. Weather Bureau revealed.

Science News Letter, February 20, 1954

CE FIELDS

BIOPHYSICS

Graying Mice Hair Measures Radiation

► GRAYING OF hair gives a radiation dosimeter of a biological kind instead of the physical or mechanical meters ordinarily used for such a measurement.

This was discovered by Drs. Jack Moshman and Arthur C. Upton of the mathematics panel and biology division, Oak Ridge National Laboratory, Oak Ridge, Tenn., in studies started by findings on mice exposed to radiation at the Eniwetok weapons tests in 1951.

These mice at Eniwetok had been exposed to graded doses of whole body radiation, they report in *Science* (Feb. 5). As early as three months afterwards, many of the more heavily irradiated mice had gray hair showing in their normally all brown coats.

Since the mice had the same ancestry, were of about the same age and had been irradiated simultaneously, the degree of graying, or hair color loss, seemed to be correlated with the dose of radiation.

Later studies at the laboratory with random samples from a colony of over 3,000 mice have borne this out.

Science News Letter, February 20, 1954

PHYSICS

TV Camera Tube Sees Both X-rays and Light

► A TELEVISION camera tube has been developed in Eindhoven, The Netherlands, which is sensitive to X-rays as well as light.

This does not mean Bob Hope will appear on your screen in the near future as a skeleton with strange blotches that represent his tie clip, cufflinks, tooth fillings and belt buckle. It does mean, however, that industries soon may make enlargements of X-ray pictures using a television set up instead of film.

The Philips Research Laboratories report that the wiry innards of two tiny transistors showed up as shadows on the screen when X-rays were used.

When combined with the usual optical lens system of a television camera, the tube produced a conventional picture of the little electrical devices. The shadow pictures were obtained after the lens was removed. The X-rays were adjusted to go through the transistors and then pass through the tube screen. Wires inside the pea-sized transistors produced shadows on the screen by stopping the X-rays.

L. Heijne, P. Schagen and H. Bruining, all of the Philips Research Laboratories, reported in *Nature* (Jan. 30), that the "two-eyed" tube uses a photoconductive material of lead oxide evaporated on a glass window. This layer, only 1/5,000 of an inch thick, is scanned by a low-velocity electron beam.

When X-rays are used as "light," the tube is filtered by a sheet of aluminum 1/50 of an inch thick.

A working model of the camera tube already has been devised. It has a scanning area about the size of a dime. The X-ray picture that falls on this small area therefore is "magnified" when reproduced on a television screen of more normal size.

The scientists believe the experimental model eventually may lead to industrial applications because of its speed of response. They also suggest it holds promise as a tool of commercial television broadcasting.

Science News Letter, February 20, 1954

PSYCHOLOGY

Babies Cry Because They Are So Taught

► BABIES ARE taught to cry, contrary to the centuries old belief that they cry naturally, states Dr. Saul Rosenzweig of the Community Child Guidance Clinic and Washington University, St. Louis, Mo.

He bases this theory on "intimate observation" of his own children, and more casual observation of many others.

Crying, he explains, is a "natural, primitive reaction in situations of distress," an "unconditioned response," as some psychologists would say. But the baby goes on using this way of communication because his other signals are not heeded.

For example, Dr. Rosenzweig says, a baby may smack his lips or stick out his tongue when he wants food. If these signals are not understood, the hungry baby finds himself in a situation of distress and cries. Then the parent or nurse comes. So the baby learns to cry instead of smacking his lips when hungry.

Other signals Dr. Rosenzweig has observed: If baby is cold, he may squirm or tremble. If he is wet, he may sneeze. One baby, aged five months, showed her tongue briefly in a licking motion when she wanted milk. When she wanted soft solids, such as baby cereal, she smacked her lips audibly.

Of course, even a baby who has been understood will sometimes cry, for example, if in pain or after being hurt. However, when the baby has successfully used other signals than crying, the crying in distress is far more meaningful.

If the baby is not taught to cry, he will, Dr. Rosenzweig believes, learn more easily and quickly to respond to the maturing and socializing process that is part of growing up. There will, he says, be "established between the parent and the baby a warm and sympathetic relationship that plays an important part in the entire development of the child." Not to mention that the nursery will be quieter.

Dr. Rosenzweig's theory is given in detail in *Mental Hygiene* (Jan.), official publication of the National Association for Mental Health.

Science News Letter, February 20, 1954

PHYSICS

Atomic Locomotive Design Worked Out

► AN ATOM-POWERED locomotive, having the power of four diesel units and competing successfully with diesels on an economic basis, has been worked out in design by a University of Utah nuclear physicist, Dr. Lyle B. Borst.

Dr. Borst said his design calls for a small atomic reactor only two feet wide, three feet high and three feet long. It would be used to make steam for a turbine-driven electric generator.

The locomotive would come in two sections: the first housing the atom power plant, the second housing the heat dissipating radiators. The small boiler would be heavily shielded to protect the engine's crew from deadly atomic radiation.

Reporting to five railroads and nine manufacturers cooperating in his study, Dr. Borst said the locomotive would require about a pound of fresh uranium every few months. It was estimated that the proposed engine could compete successfully with diesel power under "favorable circumstances."

Dr. Borst was assisted in his study by Dr. B. J. Stover, assistant research professor of chemistry; Dr. M. A. Van Dilla, assistant research professor of physics, and graduate students George K. Abel, Duncan M. Bowie, and Kent W. Petty.

Science News Letter, February 20, 1954

ZOOLOGY

Bush Dog Puppies Thrive on Formula

See Front Cover

► TWO YIPPING bush dog puppies are thriving on a bottle formula in the San Diego Zoo hospital, far from their native South American jungle home.

The two pups are probably the first of their kind to be bred and born in captivity, Ken Stott Jr., general curator of the zoo, said.

The bush dog, *Speothos venaticus*, is a rarely trapped inhabitant of the tangled jungles of northern South America. Long and low, it has the sausage proportions of a dachshund, although with a slightly heavier build.

Last summer Charles Cordier captured an adult pair in Dutch Guiana and sent the dogs to the San Diego Zoo. In January, high-pitched yelping indicated the birth of the pups. For two weeks, however, the mother kept them out of sight. On the 15th day, the mother changed her mind. She ejected the puppies from the den and ignored them.

There were four babies, two alive and two dead. The surviving pups, both males, were taken to the zoo hospital where they are growing on their bottle formula at the age of one month.

Science News Letter, February 20, 1954

ASTRONOMY

Saturn Seen With Jupiter

Most welcome astronomical event of March is the vernal equinox on March 20, bringing spring to the Northern Hemisphere, autumn to the Southern Hemisphere.

By JAMES STOKLEY

▶ JUPITER, THE brilliant planet which has been shining during recent months in the evening sky, is joined by another planet during March. This is Saturn, famous for its curious system of rings.

At the beginning of the month it comes up about 10:45, your own kind of standard time, but each evening it appears a few minutes earlier. Thus, by the end of March, it rises before nine.

Saturn does not quite get on the accompanying maps, as these show the appearance of the skies about 10:00 p.m. on March 1, 9:00 p.m. on the 15th and 8:00 p.m. on the 31st.

Saturn is in the constellation of Libra, the scales, which is just below Virgo, the virgin, a group that is shown. The magnitude of Saturn is 0.6, which places it among the typical first-magnitude stars.

Jupiter Now in Taurus

Jupiter, considerably brighter, appears in the west in Taurus, the bull. At the time of sunset, it is in the south and sets about midnight.

Jupiter and Saturn both are planets, shining by reflected sunlight, but the other luminous points that we see in the sky these evenings are stars, each a distant sun shining by its own light.

Brightest of these is Sirius, the "dog-star," in Canis Major, the great dog. Higher and farther right is Orion, the warrior, with Betelgeuse and Rigel, both of the first magnitude. Between these are the three stars in a row that form Orion's belt.

Still higher and farther right we come to Taurus, in which Jupiter now stands. The brightest star in the group is Aldebaran, marking his eye. Above Taurus is Auriga, the charioteer, with brilliant Capella, also of the first magnitude.

Moving directly upwards from Canis Major, we come to the lesser dog, Canis Minor, with the star called Procyon. And above this is the figure of Gemini, the twins, with Castor and Pollux. The latter is of the first magnitude.

Gemini, like Taurus, is one of the constellations of the zodiac, the path through which the sun and planets, as well as the moon, seem to move. So also is Cancer, the crab, to the left of the twins, but this is quite a faint constellation.

Next, along this same line, is Leo, the lion, with first magnitude Regulus. This star is at the end of the handle of a subgroup called the sickle. As a lion, the blade of the sickle forms the head, Regulus is in the right shoulder and second-magnitude Denebola, farther along, is in the tail.

Below this is Virgo, also of the zodiac. In it is Spica, which is of the first magnitude, although its low altitude, as shown, dims its light considerably.

High in the northeast the familiar figure of the great dipper is visible, the curved handle pointing toward the east, to the star Arcturus, in Bootes, the bear-driver. In the bowl of the dipper are the two pointers that show the direction to Polaris, the pole star, in Ursa Minor, the lesser bear. The great bear, Ursa Major, includes the great dipper.

Other Visible Planets

Toward the end of March, if you look carefully low in the western sky as dusk is gathering, you may be able to see the planet Venus. Although it is drawing to the east, away from the sun, even at the end of March it goes down before the sky is completely dark. In another month it will be seen easily. On March 28, Mercury is farthest west of the sun, and rises in the east before sunrise, but even then it will be hard to locate.

The red planet Mars, however, can be seen in the early morning sky in the constellation of Scorpius, the scorpion. It rises above the eastern horizon about 1:00 a.m.

Perhaps the most welcome astronomical event of March is one that occurs on March 20 at 10:54 p.m., EST. At that moment the sun, which has been moving northward through the sky since last December, reaches its halfway point and stands directly over the equator. This is the vernal equinox, marking the beginning of spring in the Northern Hemisphere. In the Southern Hemisphere, it is the beginning of autumn.

If we still followed the practice that prevailed a couple of centuries ago, the vernal equinox would mark the beginning of a new year. In England, and its colonies, the year began with the first day of spring, arbitrarily set at March 25, until 1752, when the year started on Jan. 1. That was also the year in which the British adopted the Gregorian calendar, introduced in Catholic countries immediately after Pope Gregory XIII established it by a papal bull in 1582.

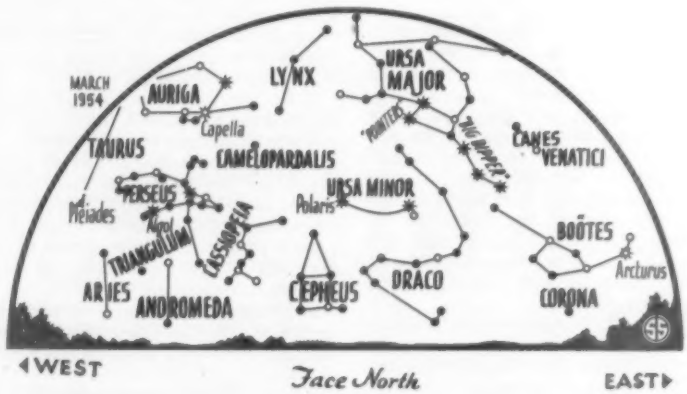
Two Dates Used

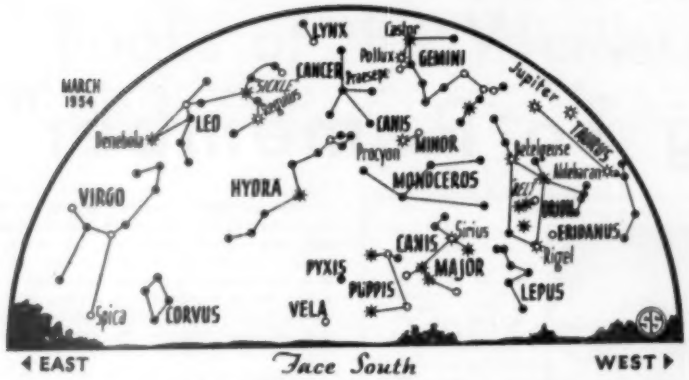
In Scotland, although the Gregorian calendar had not been adopted then, the change of the beginning of the year had been made more than a century and a half earlier, in 1600. Before 1752, it was the custom in England to write dates between Jan. 1 and March 25 with both years, thus, "Feb. 15, 1742/3," indicating that it was 1742 by the old style, with the year beginning in March, and 1743 if you began it on Jan. 1, according to the new style.

Many earlier calendars, such as the one used by the Greeks, began the year with the vernal equinox. Since this marked the reawakening of nature and the renewal of agricultural and other activities that had been suspended for the winter, it was an appropriate beginning for a new cycle. Moreover, it was easy to determine.

We can picture their priests, who were also the astronomers, watching the rising sun, morning after morning, as the winter came to an end. It had been rising in the southeast, but the rising point was gradually creeping northwards. Finally, one day, they would find it coming up directly east, as it does at the equinox, and then they could announce to their followers that the new year had started.

For such reasons, many of their temples were "oriented," i.e., they faced directly





SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

east. Then, with the doors open, at the equinox, the rays of the rising sun would shine straight down the main aisle to the high altar. The historian Josephus tells us that Solomon's temple at Jerusalem was thus open to the east.

Many early Christian churches were similarly oriented. St. Peter's, in Rome, as its predecessor, the basilica built on the Vatican hill in the fourth century by the Emperor Constantine, similarly faces the sun as it rises about March 21.

After the sixth century, however, there arose an alternative practice of having a church face the west. Then the worshipers, rather than the priest, could face the rising sun as its rays shone in through windows above the altar.

Celestial Time Table for March

Mar.	EST	
1	5:00 a.m.	Mercury between earth and sun.
4	10:11 p.m.	New moon.
6	5:00 a.m.	Moon nearest, distance 223,500 miles.
7	1:00 a.m.	Algol (variable star in Perseus) at minimum.
9	9:49 p.m.	Algol (variable star in Perseus) at minimum.
11	8:21 a.m.	Moon passes Jupiter.
	12:51 p.m.	Moon in first quarter.
12	6:38 p.m.	Algol at minimum.
19	7:42 a.m.	Full moon.
20	10:54 p.m.	Sun crosses equator, spring commences in Northern Hemisphere.
21	1:00 p.m.	Moon farthest from earth, distance 252,400 miles.
22	9:28 p.m.	Moon passes Saturn.
26	9:34 a.m.	Moon passes Mars.
27	11:14 a.m.	Moon in laster quarter.
28	10:00 a.m.	Mercury farthest west of sun.
29	11:34 p.m.	Algol at minimum.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, February 20, 1954

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AMPHIBIANS AND REPTILES OF YEMEN—Karl P. Schmidt—*Chicago Natural History Museum*, Fieldiana—Zoology, Volume 34, Number 24, 9 p., illus., paper, 15 cents. This ancient kingdom of the Queen of Sheba has been almost completely closed to foreigners through much of its history. The need for advice concerning matters of public health led to the invitation to foreign medical missions to come to the country.

ANCIENT HISTORY OF WESTERN ASIA, INDIA AND CRETE—Bedrich Hrozny—*Philosophical Library*, 260 p., illus., $12.00. The history of this part of the world includes the story of the oldest known human cultures. The author is professor of Oriental languages and history at Charles' University, Prague.

THE BRITISH CONTRIBUTION TO MEDICINE — Jaime Jaramillo-Arango, with foreword by Sir Arthur Macnalty — *Livingstone (Williams & Wilkins)*, 220 p., illus., $6.00. A physician from Colombia who also served as his nation's ambassador in London writes this appraisal of England's contribution to medicine, with special emphasis on the conquest of typhoid, the development of penicillin, the antibiotics and vitamins.

CHAMBERS' SHORTER SIX-FIGURE MATHEMATICAL TABLES—L. J. Comrie—*Chemical Publishing Company*, 387 p., $6.50. The author holds that these 6-figure tables are accurate enough to cover 95 per cent of computational requirements.

CLIMATIC CHANGE: Evidence, Causes, and Effects—Harlow Shapley, Ed.—*Harvard University Press*, 318 p., illus., $6.00. A group of authoritative papers brought together by the Rumford Committee which tell the story of evolution as affected by changes in climate, and the evidence to be found of these changes as recorded in rocks, tree rings, the melting point of bone marrow and other such indexes.

CONSTRUCTION FINANCING FOR HOME BUILDERS—Neal MacGiehan—*Govt. Printing Office*, Bulletin of Housing and Home Finance Agency, 128 p., paper, 70 cents. Intended as a practical guide for home builders.

CONTRIBUTIONS TO THE FLORA OF VENEZUELA: From Ericaceae through Compositae—Julian A. Steyermark and others—*Chicago Natural History Museum*, Fieldiana—Botany, Volume 28, Number 3, 230 p., illus., paper, $4.25.

CROCODILE FEVER: A True Story of Adventure —Lawrence Earl—*Knopf*, 293 p., illus., $3.95. Written by a Canadian newspaper man, this book gives the reader a picture of life among the wild creatures of the Zambezi jungles.

DISEASES OF BRITISH GRASSES AND HERBAGE LEGUMES—Kathleen Sampson and J. H. Western *Cambridge University Press*, 2d ed., 118 p., illus., $3.00. Grass may be claimed as the oldest agricultural crop, but it is only in recent years that diseases of grasses have attracted the attention of practical men.

FINANCING THE CONSTRUCTION OF PREFABRICATED HOUSES—Arthur E. Warner—*Govt. Printing Office*, Housing Research Paper No. 27, 55

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p., paper, 40 cents. Report of a special study made by the School of Business, Indiana University.

FRESH-WATER LIMESTONE FROM THE TOROLA VALLEY, NORTHEASTERN EL SALVADOR—Sharat Kumar Roy and Robert Kriss Wyant—*Chicago Natural History Museum*, Fieldiana — Geology, Volume 10, Number 16, 19 p., illus., paper, 50 cents.

THE GEOLOGY OF CHACO CANYON, NEW MEXICO IN RELATION TO THE LIFE AND REMAINS OF THE PREHISTORIC PEOPLES OF PUEBLO BONITO —Kirk Bryan—*Smithsonian*, Miscellaneous Collections, Volume 122, Number 7, 65 p., illus., paper, 90 cents. Shows that the canyon went through a cycle of cutting and refilling three times. Evidence indicates that the residents of Pueblo Bonito practiced floodwater farming and abandoned the site when cutting of the arroyo put an end to this type of farming.

GEOLOGY OF THE GRIFFITH PARK AREA LOS ANGELES COUNTY, CALIFORNIA — George J. Neuerburg—*California Division of Mines*, Special Report 33, 29 p., illus., paper, 50 cents. The site of this study is the largest municipal park in the world, and it is there that Griffith Observatory is located.

INDUSTRIAL FERMENTATIONS: Volume I — Leland A. Underkofler and Richard J. Hickey—*Chemical Publishing Company*, 565 p., illus., $12.00. Fermentations are among the oldest chemical processes used by mankind, but it is only in the present century that they have been put on a scientific basis. This symposium presents an authoritative review of recent advances.

INTERTIDAL INVERTEBRATES OF THE CENTRAL CALIFORNIA COAST: S. F. Light's Laboratory and Field Text in Invertebrate Zoology—Revised by Ralph I. Smith and others — *University of California Press*, 446 p., illus., $5.00. At the time of Prof. Light's death, the first edition of this manual was practically out of print and only a small amount of the work of revision had been carried out by the author. It has now been completely revised.

AN INTRODUCTION TO JOURNALISM: A Survey of the Fourth Estate in All Its Forms—F. Fraser Bond — *Macmillan*, 358 p., illus., $4.50. A text book for general beginning courses in journalism.

THE MACMILLAN WILD FLOWER BOOK—Descriptive text by Clarence J. Hylander, illustrations by Edith Farrington Johnston — *Macmillan*, 480 p., illus., $15.00. A profusion of 4- to 6-color plates makes this a beautiful book as well as a useful guide to wild flowers.

THE MIND AND THE EYE: A Study of the Biologist's Standpoint — Agnes Arber — *Cambridge University Press*, 146 p., $3.00. Presenting a botanist's approach to his own subject and to philosophy.

THE MONKEY BOOK—Ernest P. Walker—*Macmillan*, 153 p., illus., $6.50. Bringing together the answers to the questions most frequently asked about the care and handling of this delicate pet.

THE NATURAL HISTORY OF MAMMALS — Francois Bourliere—*Knopf*, 363 p., illus., $5.00. A readable account of the interesting habits and ecology of wild mammals.

NATURE AND THE GREEKS—Erwin Schroedinger — *Cambridge University Press*, 96 p., $2.00. "By the serious attempt to put ourselves back into the intellectual situation of the ancient thinkers, far less experienced as regards the actual behaviour of nature, but also very often much less biased," explains the Nobelist author, "we may regain from them their freedom of thought—albeit possibly in order to use it, aided by our superior knowledge of facts, for correcting early mistakes."

PUBLIC EXPENDITURE ON EDUCATION: A Preliminary Statistical Report—Department of Social Science, UNESCO — *Education Clearing House, UNESCO*, 129 p., paper, free upon request direct to publisher, 19, Avenue Kleber, Paris XVI, France.

RAT QUALITY A CONSIDERATION OF HEREDITY, DIET AND DISEASE: Proceedings of the Symposium Held at Columbia University, College of Physicians and Surgeons, New York, N. Y., January 31, 1952—W. E. Heston and others—*National Vitamin Foundation*, 138 p., illus., paper, $2.50. Despite the complexity of the rat as a laboratory instrument, some investigators have failed to pay much attention to its standardization.

SOME MAMMALS OF YEMEN AND THEIR ECTOPARASITES—Colin Campbell Sanborn and Harry Hoogstraal—*Chicago Natural History Museum*, Fieldiana—Zoology, Volume 34, Number 23, 24 p., paper, 35 cents.

SUPPLEMENT TO INSECT ENEMIES OF EASTERN FORESTS (MISCELLANEOUS PUBLICATION 657): Index to Insects by Host Plants—J. V. Schaffner, Jr. — *Govt. Printing Office*, 29 p., paper, 15 cents. Intended to enable foresters and others not trained in entomology to identify an insect that is causing damage to a particular kind of tree or shrub.

TOXICITY OF INDUSTRIAL ORGANIC SOLVENTS: Revised in Consultation With the Toxicology Committee — Ethel Browning — *Chemical Publishing Company*, rev. American ed., 411 p., $8.00. Important to those concerned with the health and safety of industrial workers.

A TREASURY OF SCIENCE—Harlow Shapley, Samuel Rapport and Helen Wright, Eds. — *Harper*, 3d rev. ed., 724 p., $5.95. In this new edition, the atom is removed from a supplement and integrated into the main part of the book. A new section is added on Science and the Future.

TUNGSTEN DEPOSITS OF MADERA, FRESNO AND TULARE COUNTIES, CALIFORNIA — Konrad B. Krauskopf—*California Division of Mines*, Special Report 35, 83 p., illus., paper, $1.25. The surface exposures have been well prospected and most of the accessible deposits have been exploited.

ZEIN: An Annotated Bibliography 1891-1953 —Dorothy M. Rathmann—*Mellon Institute*, 118 p., paper, free upon request direct to publisher 4400 Fifth Ave., Pittsburgh 13, Pa. Since it became commercially available in 1944, interest has been increasing in this alcohol-soluble protein from corn with its ever-widening industrial uses. Here are listed 942 citations.

Science News Letter, February 20, 1954

MYCOLOGY

Soil Fungus Produces Nitrate From Nitrogen

▶ A SOIL fungus that can produce nitrate nitrogen from organic nitrogen has been found by Dr. Edwin L. Schmidt of the University of Minnesota.

Since around 1890, scientists have attributed the formation of nitrates in the soil to a few kinds of highly specific soil bacteria that oxidize ammonium nitrogen to nitrate in a two-step process.

Nitrogen is fundamental in the production of protein by plants. Most plants cannot use pure nitrogen, and need it fixed in some other form as nitrates, nitrites or ammonia.

Dr. Schmidt's work, reported in *Science* (Feb. 5), is the first indication that fungi may participate in the nitrification process. Most such organisms stop with the production of nitrite nitrogen, one step below nitrate.

The fungus is *Aspergillus flavus*, a common soil organism. Dr. Schmidt grew the fungus in a liquid culture medium containing organic nitrogen. No observation that the fungus will produce nitrates in soil has been made. He said that studies are now underway to determine the abundance of nitrifying fungi in the soil.

Science News Letter, February 20, 1954

The farmer's share of the consumer's *food dollar* in 1953 averaged about 45 cents, about two cents less than in 1952.

Citrus fruits, important crops in Florida, California and Texas, are native to Asia.

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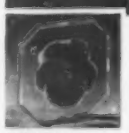

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ZOOLOGY

NATURE RAMBLINGS

Wolves

► ACCORDING TO ancient legend, a pair of infant twin boys were thrown into the river. A she-wolf rescued the pair, nursed them, and raised them to young manhood. One of the boys founded a city which survives to this day.

The boys were Romulus and Remus. And the city was Rome.

According to another fable, a little girl wearing a red cloak traveled through the woods to see her grandmother. When she arrived, she found not grandma but a wolf dressed in grandma's cap.

The little girl, of course, was Little Red Ridinghood.

Of the two sides of the wolf's nature which are contrasted so sharply in these stories, most people would say the second contained the truth of the matter.

However, the Romulus-Remus story, preposterous though it may actually be, has its adherents, even today. Some biologists who have observed wolves closely are of the opinion that the domestic life of a wolf is a shining example of love, kindliness and consideration.

Wolf "marriages" are believed to last a lifetime, and the solicitude shown the young by both parents is supposed to be of the tenderest. When the pups are young and sportive, and their horse-play overflows into the vicinity of papa wolf, he does not send them sprawling with a snarling backhand blow. Instead, he patiently gets up and moves out of the arena of juvenile rambunctiousness.

This sort of paternal care and thoughtfulness, which extends into the areas of feeding and training the young how to hunt, is a far cry from such philanthropies as rescuing human young from rivers and tending to their every need till the human can fend for himself.

But the two myths, with their contradictory views of this wild relative of the dog, do serve to underscore a controversy about wolves that persists to this day.

Although in great stretches of the United States wolves have been all but exterminated, in the timbered expanses of Canada and Alaska, they survive in considerable numbers. Since they are predators who live by killing wild game, or domestic stock where they can, the northern wolf population exacts a constant toll of mountain-sheep, moose, caribou and other animals.

On one side of the controversy is a group of conservationists who believe that man must go in and kill the wolves with planes, poisons, guns and traps to save the game from extinction. The other group maintains that wolves exercise a weeding-out effect, killing the stragglers, leaving the most fit.

It is the age-old disagreement, with a new bitterness. Romulus and Ridinghood can't both be right.

Science News Letter, February 20, 1954

About one-fourth of the *land* in the United States is cropland, and more than half is permanent pasture and grazing land.

A black and white watercolor painting of two ringed-necked *ducks* coming in for a landing has been chosen as the design for the 1954-55 Migratory Bird Hunting Stamp.

Questions

AGRICULTURE — How could present coffee production be nearly doubled? p. 120.

□ □ □

BIOPHYSICS—What acts as biological dosimeter of radiation exposure in mice? p. 121.

□ □ □

MEDICINE—What new drug combination is recommended for TB treatment? p. 116.

□ □ □

PSYCHIATRY—How do slot machines aid schizophrenic patients? p. 120.

□ □ □

PSYCHOLOGY—How do babies learn to cry? p. 121.

□ □ □

PUBLIC HEALTH — What points should a rabies control program cover? p. 119.

□ □ □

Photographs: Cover, Zoological Society of San Diego; p. 115, McDonnell Aircraft Corporation; p. 117, Syracuse University; p. 119, General Electric Company; p. 128, Chrysler Corporation.

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BABY GEIGER COUNTER is barely larger than a king-sized package of cigarettes. Extremely accurate and sensitive in detecting radioactivity, the instrument provides continuous or intermittent service. It is designed as a civil defense aid for home or office. Used with earphones, the counter is also valuable for amateur or professional radioactive-ore prospecting.

Science News Letter, February 20, 1954

INFRARED HEAT LAMP has been designed to handle special commercial jobs running the gamut from drying of printing inks to quick toasting of sandwiches. The 1,550-watt lamp has two filaments that permit the bulb to be operated at wattages of 650, 900 and 1,550.

Science News Letter, February 20, 1954

MAGNETIC ALARM system sounds a warning when too many tramp iron and ferrous particles collect on magnetic separators used on production lines to decrease machinery and product damage, fire and explosions. A sensitive ferrometer watches the tramp-iron collector and triggers bells, buzzers or lights when the collector needs attention.

Science News Letter, February 20, 1954

CASEMENT WINDOW air conditioner for apartments, houses and buildings is "the only unit of its type that can be installed

without altering the frame or glass-pane structure of the casement window," the manufacturer reports. Mounted against the window on the inside, as shown in the illustration, the device does not interfere with opening, closing or locking of windows.

Science News Letter, February 20, 1954

"FILLING STATIONS" for airplanes are portable, collapsible rubberized tanks in which 10,000 gallons of high octane gasoline or jet fuel can be stored. The "tanks" are pillow-shaped and can lie completely exposed on the ground.

Science News Letter, February 20, 1954

MAGNESIUM STEPLADDER is light enough for a stenographer or housewife to carry around. The stepladder has a small platform two feet from the top that permits the user to work in more comfort than if he had to stand on one of the steps. The ladder's feet are equipped with hard rubber, non-skid tips.

Science News Letter, February 20, 1954

PORTABLE ELECTRIC TIMER automatically starts an electric engine heater which many motorists in severe climates use to warm their auto engines on sub-zero mornings. Should the motorist not use the car some morning, the timer automatically switches the engine heater off.

Science News Letter, February 20, 1954

SPECIAL NAILS enable home owners to transform their drab basements into colorful game rooms, dens and workshops without drilling into concrete walls. The nails are mounted on square gridworks that are bonded to the concrete wall with a special adhesive. Furring strips or partition sills then can be put in place. One kit contains enough adhesive and nails to do 20 lineal feet of wall.

Science News Letter, February 20, 1954

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2-20-4

Do You Know?

A high-yielding new *strawberry*, Pocahontas, has been developed which is larger and redder than other strawberries.

The potential *energy* in a lump of uranium the size of a golf ball is the equivalent of 460,000 gallons of fuel oil, or 3,000 tons of coal.

Mach number one is equal to the speed of sound at sea level at 59 degrees Fahrenheit, or 761 miles per hour.

Television viewers in Italy pay an annual subscription fee of $24 for a guaranteed five hours daily of reception.

Tear gas, long used by police on criminals, has become a weapon against a fungus disease on chrysanthemums.

Oils have been used as *insecticides* for over 50 years without insects developing a resistance to them.